

Magnetic Resonance Imaging of Pelvic Metastases in Male Patients

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KEYWORDS

- Pelvic metastases • MR imaging • Nodal metastases • Skeletal metastases
- Peritoneal metastases

KEY POINTS

- Lymph node involvement signifies an adverse prognosis and modifies the treatment strategies. The number and regions of affected pelvic nodes directly influence the survival rate.
- Superior soft tissue resolution of magnetic resonance (MR) imaging aids in detection of metastatic lesions to visceral organs and detects nonpalpable lesions of the prostate, penis, and testes.
- Disseminated tumors commonly seed pelvic recesses lined by parietal peritoneum, followed by accumulation of increasing amounts of ascites in the bilateral paravesical recesses.
- MR imaging offers better characterization of musculoskeletal metastasis compared with computed tomography and conventional radiography.
- With diffusion-weighted imaging and nanoparticle-enhanced MR imaging there is an impending paradigm shift from structural to functional imaging.

INTRODUCTION

The pelvis is a common site for primary and metastatic tumors. Diagnosis of pelvic metastatic lesions is a crucial step in the staging of primary cancer because it implies an adverse prognosis. Magnetic resonance (MR) imaging is a noninvasive imaging tool for diagnosis of pelvic metastasis based on its multiplanar imaging capability and excellent soft tissue resolution. In addition, MR imaging can also differentiate between different tissue elements including characterization of vascular and nonvascular structures without contrast.¹ Knowledge of basic MR signal characteristics of normal (Figs. 1–5, Table 1) and abnormal structures is essential for accurate interpretation of pelvic MR imaging. This article provides a concise overview of nodal, visceral, and musculoskeletal metastatic lesions affecting the pelvis and their MR imaging characteristics.²

LYMPH NODE METASTASIS

In most patients with known pelvic malignancies, presence of nodal disease signifies adverse prognosis and dictates treatment strategies. The number and regions of the pelvic nodes involved affect the nodal (N) and metastasis (M) staging of the tumor and also influence the survival rate. Understanding the lymphatic drainage pathways and MR diagnostic criteria of abnormal nodes can help in the evaluation of pelvic lymph node metastasis.³

Pelvic Lymphatic Metastatic Pathways

The primary lymphatic drainage in the male pelvis includes 4 pathways: (1) the anterior route, draining lymph from the anterior wall of the bladder to the internal iliac (hypogastric) nodes; (2) the lateral

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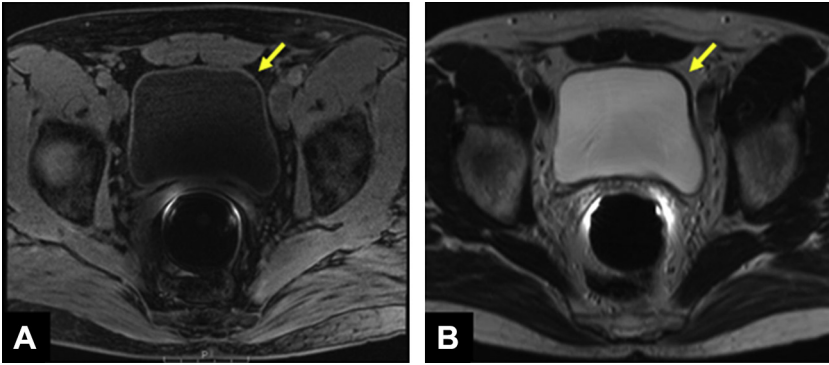


Fig. 1. Normal urinary bladder. (A) Axial T1-weighted image shows intermediate signal intensity of urinary bladder wall (*arrow*). (B) Axial T2-weighted image shows low signal intensity of urinary bladder wall (*arrow*).

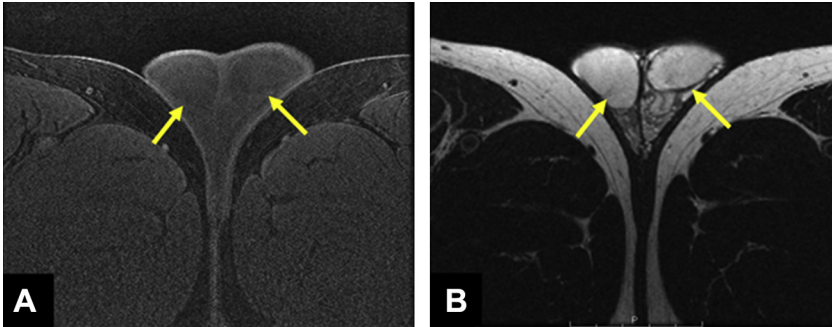


Fig. 2. Normal testicles. (A) Axial T1-weighted image shows homogeneous intermediate signal intensity of bilateral testicles (*arrows*). (B) Axial T2-weighted image shows high signal intensity of both testicles (*arrows*).

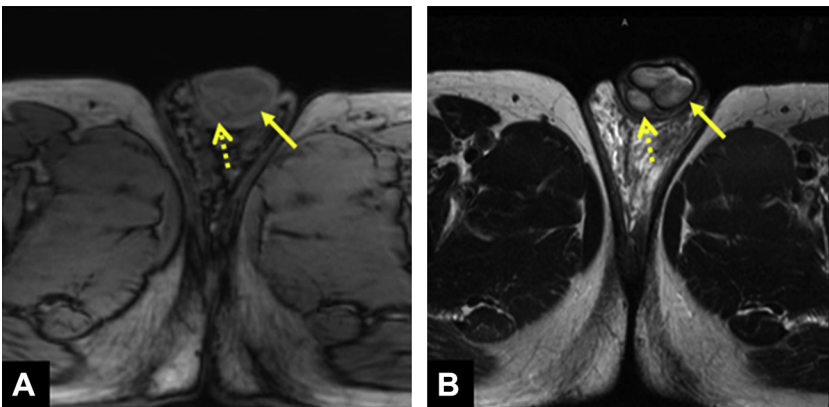


Fig. 3. Normal penis. (A) Axial T1-weighted image shows intermediate signal intensity of the corpus cavernosum (*arrow*) and spongiosum (*dotted arrow*). (B) Axial T2-weighted image shows high signal intensity of the corpus spongiosum (*dotted arrow*) and heterogeneous signal intensity of the corpus cavernosum (*arrow*).

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